Delinking of Local and International Prices: Exploring Competition in the Bangladesh Rice Market

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SECTION 1: INTRODUCTION

In the recent years Bangladeshi rice market often experienced price increasesnotwithstanding there has been decline in rice prices in the international markets. For instance, rice prices increased by 27 percent in Dhaka, during late 2009 and early 2010 whereas rice prices in the international market fellby 6 percent during the same period due to increased supply from Vietnam and Thailand (World Bank, 2010). This divergence of domestic and international prices is somewhat surprising given the presumption that prices of tradable goods of small open economies are supposed to be set at a levelbetween their respective export parity prices and import parity prices. This suggests that domestic prices should adjust close to their import parity price levels at least after a brief time period required to transport the goods from abroad. Murshid et al. (2009), for example, concludes that the recent increase in rice prices wasnot related to domestic production per se and that such price increase might be explained by international prices, market forces and other unobservable factors. By examining price

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trends of local and international varieties of rice, we observe that both nominal and real prices show upward and downward movements during 1997 to 2007 period with persistently upward trend in the last periods of investigation.[2] In case of international varieties, we also observe similar trends suggesting integration in an open economy context. Our time series analysis generally suggests the existence of long term relationship between prices of local (Bangladesh) varieties of rice with several international varieties of rice. In particular, we find strong long-term relationship of price of local varies with the 'Indian 25 percent variety', which is consistent with the fact that major rice imports were from India during the period of study. However, as in the recent years private imports of rice were virtually not happening in our context suggesting that the recent price divergences could only be explained through local market dynamics and agents behaviors and we make an exploratory attempt in this regard.

The query that follows is: *what exactly is the nature of competition at different stages of the domestic rice market of Bangladesh?*Existing literature concludes that rice markets in Bangladesh is generally *competitive* (Murshid et al., 2009; Minten et al., 2010), albeit such conclusion is not based on rigorous assessment of incentives and behaviors of the diverse groups of agents operating in the market. Unless the latter are closely examined one cannot reach to a convincing conclusion regarding the *state of competitiveness* of the market (seeTimmer et al 1983). Moreover,it is entirely possible that the market operates quite competitively within one stage, whereas competition is greatlyrestricted in another stage. Therefore this study focuses on aspects of *market competitiveness* by explaining incentives and behaviors of different agents in different segments of rice market. The rest of the chapter is organized as follows: Section 2 briefly summarizes the existing literature on rice market institutions in Bangladesh, Section 3 outlines the methodology of the current study and

[2] See for detail time series analysis Mahmud and Wadood(2012).

Section 4 discuss the state of competitiveness of different segments of rice markets i.e. from growers to retailers. Section 5 summarizes and concludes the paper.

SECTION 2: LITERATURE ON RICE MARKET INSTITUTIONS IN BANGLADESH

Some of the early research (Ravallion 1986, 1987; Chowdhury, 1992) suggests that rice markets in Bangladesh were *highly competitive*. As of now a number of studies have systematically studied the rice market of Bangladeshbut only a handful of past researches have specifically explored different agents operating in the paddy-rice trade circuit ofBangladesh (see Chowdhury, 1992; Crow and Murshid, 1994; Baulch et al., 1998; Murshid, 2001; Murshid et al., 2009).Market's spatial integration studies agree that some price transmission exists between Dhaka and other major rice markets, i.e. markets are not totally segmented. Dorosh (1999) pointed that there waslittle scope for a small group of traders to significantly affect market supply and prices. Contrary results were observed by Osmani and Quasem (1990) and Crow and Murshid (1994). Chowdhury and Haggblade (2000) mentioned intense competition among the traders and suggested that most market participants behaved like competitive profit-makers. Due to increased use of high-yielding varieties, improved infrastructure, less tied credit, more information-efficient market structures and increasing number of market participants, the competitiveness increased.Murshid et al. (2009) is one recent study that discusses food insecurity, instability of food grain production and prices, nature of food markets, policies, etc. Referring to previous studies (Ravallion, 1986, 1987; Dawson and Dey, 2002), Murshid et al. (2009)conclude that the common perception is that the rice market in Bangladesh is sufficiently competitive and therefore there was little room for public interventions. The authors also found that the rice markets in Bangladesh were well integrated except for some specific locations. Minten et al. (2010) discuss the issue of agricultural marketing, price stabilization, value chain and international trade. They conclude that the markets have

become better integrated over time as a result of large investments in road infrastructure by the government and donor agencies and wider availability of mobile phones. The authors suggest that information flows rapidly in the markets and food grains flow from surplus to deficit areas whenever the need arises. According to them, there also appears to be little collusion between traders to fix prices, except for short periods.

SECTION 3: METHODOLOGY OF THE STUDY

We aim to assess market competitiveness by comprehensively surveyingmarket segments in different parts of the country. The primary survey of rice markets institutions was conducted during the months of March and April of 2011, covering namely the districts of Dinajpur, Naogaon, Bogra, Kushtia, Jessore, Chittagong and Dhaka. These locations were selected based on the fact that we wanted to study major rice trading hubs of the country so that the overall state of the supply chain isreflected. Hence, in addition to the major supply points (Dinajpur, Naogaon, Bogra, Kushtia and Jessore), major urban destinations (Chittagong and Dhaka) were also covered. The survey included structured and semi-structured interviews with growers (the very first node of the supply chain), millers, rice *aratdars* (brokers, also known as commission agents), rice wholesalers and retailers (the last point of the chain from whom consumers buy rice)(see Murshid et al. (2009) for a detailed discussion on the agents in supply chain). Moreover, key community persons of selected villages and key informants of surveyed markets were interviewed to gather details of rice trading in their respective areas/markets. The instruments that were used are described as follows:

(a) **Enterprise questionnaire** (for millers, wholesalers, *aratdars* and retailers) inquiring about firm specific information on ownership, employees, assets, establishment, involvements in the business associations (*samity*), business relations, financing, credit situation, suppliers and customers, costs and revenues and details of pricing decisions and bargaining. In addition, market specific information i.e. market shares, entry and exit,

exports and imports and storage were also covered. Furthermore, the rice traders were asked to recall prices of different rice varieties sold during the last one year at an average monthly frequency.

(b) **Key Informant' Information** (for millers, wholesalers, *aratdars* and retailers) in each of the markets by interviewing knowledgeable paddy/rice traders who were active in the respective market for at least 5 years. The questions were designed to target market specific informationsuch as market shares, entry and exit, exports and imports, storage, business financing and details of pricing decisions and bargaining.

(c) **Farmer questionnaire** (for paddy growers) addressing information on agricultural land use, paddy/rice crops, business relations, financing, loan situation, customers and details of pricing decisions and bargaining.

(d) **Community questionnaire** (for key persons in the surveyed villages) focusing on general information on the village/locality, sources of credit in the area, production information and distances to/from major destinations/locations.

(e) **Price List** (in each of the surveyed locations) exhibiting local retail and wholesale prices of various agricultural products, enterprise and agricultural inputs, cost of transporting goods and consumer goods.

The distribution of questionnaire in each location is summarized in Table 1.

>>> TABLE 1 HERE

SECTION 4: DISCUSSION ON RICE MARKET COMPETITIVENESS

A starting point of discussion on *market competitiveness* can be the idealized textbook version of perfect competition. We can define *perfect competition* as a market outcome in which all firms produce homogenous(or identical) and perfectly divisible output and face no barriers(without incurring special expenses) to entry or exit; producers and consumers have full information about the market including the price and quality of the product, incur no

transaction costs, and are price takers(cannot individually influence the price at which the product is sold), and there are no externalities(firms bear the cost of its production process) (see Carlton and Perloff (2000)). We can consider some industries as reasonably *competitive*if they have certain characteristics. Price-taking behavior, many firms and free entry and exit are often used as criteria to judge the *competitiveness of a market*.

4.1 Market for Paddy Growers

In order to investigate the *state of competitiveness* in the primary grower's market, first we point out some basic features or testable implications that are expected to be present in this segment of the market if it were competitive. First we expect a large number of buyers and sellers within this segment, and that no individual agent has control over market prices. This condition is fulfilled in the primary growers' market segment since there isa very large number of sellers (primary growers) and an arguably large number of millers, *farias* and *paddy aratdars* who function as buyers and that no single agent can dictate the market prices. Second we expect free entry and exit. This condition is also met in this segment since we do not find any significant barriers for entry. Third, we expect bargains among the agents to settle the price, where no particular agent is constrained in any way to settle bargains. Constrained bargaining may lead to economic losses for the agent who faces this problem and thereby the opposite party in the transaction may gain out of this situation. A market cannot be considered sufficiently "competitive" where some agents are faced with restricted bargaining capacity due to problems that they face, for example, credit or cash constraints, lack of storage capacity, limited information, etc. It is in the case of this third condition, that we find some problems related to *competitiveness* for the primary grower segment of the rice market.

4.1.1 Sample villages for paddy growers

The primary survey covered a total of four villages in two districts. The villages are Harish Chandrapur in Bochaganjupazilla and Korimullahpurmohalla within Dinajpursadar area in Dinajpur district; Kadowa and Debipur villages within Naogaonsadar area in Naogaon district. Our survey team collected community information from selected key informants, verified those with a larger group of audience and completed face-to-face questionnaire interviewswith fourteen farmers with some farm holdings. The selected villages are located within a five kilometer radius of some of the rice wholesaler markets that we have surveyed. These areaswere well connected with important locations and establishments such as, roadsand bazaars. The number of households varied across villages—with the highest being 700 in Korimullahpur and lowest of 200 in Debipur, the remaining two consisted of around 350 households each. All four villages had access to electricity. Crop agriculture and daily agricultural wage labor were found to be the two most important economic activities of all of them, whereas, business/hotel/restaurant activities were ranked third. Mobile phones were seen as the principal means of information communication in all of these places. Rickshaw vans, rickshaws and bicycles were considered the principal means of physical communication. All of the selected areas had some NGO programs currently running. Agricultural credits were available from both NGOs and Krishi Bank.

4.1.2 **Paddy Growers Profile**

In Dinajpur locations, the four surveyed farmers in the village Harishchandrapur had on an average 350 decimals of crop land, three of them are classified as “medium” sized farmers and one as a “small” farmer. The four farmers in the village Korimullahpur had an average of 120 decimals of crop land, three of them fell in the“small” categoryand one in the “landless, sharecropper” category. On the other hand, in the Naogaon locations, three Kadowa farmers had on an average 295 decimals (one “medium” and two “small”) and three Debipur farmers had 110 decimals (one “medium”, one “small” and one “marginal”). Thus we surveyed five

"medium", seven "small", one "marginal" and one "landless" category farmers. The median amount of crop land owned across the villages is 159 decimals - we understand a typical respondent is a "small" farmer. The median amount of homestead land is only 10 decimals. Median age of the surveyed farmers is 53 years and median number of years of schooling is only 6 years, with a maximum value of 12 years. All the respondents are male. Farmers have reported to be intensely involved in crop agriculture in the months of April, May, and June, and again in November, December and January, while being involved in other activities during the rest of the year.

4.1.3 Paddy Growers' Pricing Decisions

The surveyed farmers have reportedboth, their crop returns and local harvest period price of paddy. We find that harvest prices varied across villages, for example, for the same BR 28 variety paddy, Harishchandrapur farmers reported harvest period prices to be TK. 12.5 per kg (cost of production is reported at TK. 8.6 per kg) and Korimullahpur farmers reported TK. 13 per kg (cost of production at TK. 11.8). We find higher prices in Naogaon villages-- both Kadowa and Debipur farmers report TK. 15 (cost of production is TK. 12.5 or less in both cases). Harvest period prices to be received by the farmers are settled in the local markets and this depends on local demand and supply conditions. We note that each individual grower bargains with beparis or farias, so the price they finally settle at depends largely on the individual-level bargaining. The surveyed farmers do not have any collective bargaining agency or cooperative associations in order to negotiate prices on a collective basis.

The paddy growers have contacts with beparis and farias, and sell paddy to them, mostlyduring the harvest period. On an average, a paddy grower has 13 business contacts (the maximum value found is 35 and the minimum is only one); these contacts are with bepari, miller, paddy aratdar and farias. All the business transactions with them are informal, with no legal documentation. The transactions are in both cash and credit. Taking credit from millers,

beparis or farias is quite common among the paddy growers during harvest season, most commonly for purchase of inputs. We find that the number of business contacts a paddy grower has is statistically significantly positively associated with the amount of his landholdings at 10% significance level (p-value=0.068). This implies a larger farmer tends to have larger number of business contacts (and therefore larger set of options to choose from) whereas, the situation tends to worsen for a small farmer with fewer number of business contacts. In addition to that, paddy growers do not have many reliable sources of credit; they have little access to formal banking sources.

A summary from the farmer questionnaire illustrates the pattern of transactions that take place. In Harishchandrapur, in 6 out of 12 cases, there were more than 80% sale immediately after the harvest. In addition to that, in 6 cases there were tied transactions--advances were taken against production expenses. In Korimullahpur, in 7 out of 13 cases, there were of immediate sale of more than 80%, and in 3 cases advance credit were taken. The Naogaon farmers have reported better records of transactions, out of a total of 15 cases in two villages, only one case of immediate sale of more than 80% and 7 cases of advance credit being taken implying tied transaction.

The surveyed farmers reported that *bepari*s and *faria*s visit their places during the harvest time and collect samples. Most of these intermediaries are representatives from millers. The intermediaries examine the quality of the paddy and then they offer some rates. There is often a maximum offer, beyond which *beparis* and *farias* rarely want to settle. Once the farmer agrees, the intermediaries arrange for transport and send it to the miller. Farmers admit that, even though both they and the counterpart intermediaries come up with price quotations, invariably this is the price quoted by the intermediaries that matter, not theirs. This happens because farmers lack sufficient facilities for storage of paddy; and thus keeping paddy for long, most of the time, is not a viable option. This implies that the surveyed

farmers lack bargaining power and have to accept the price that is set by the millers or their representatives. We can summarize that even though the paddy growers' segment may look "competitive", the very nature of *competitiveness* is cast in doubt due to the constrained pattern of bargaining on behalf of the primary growers in this segment.

4.2 Market for Wholesalers

We find that the rice wholesaler market easily meets the first condition of *competitiveness*; that is it covers a large number of buyers (end-point wholesalers or retailers) and sellers (millers, commission agents or wholesalers). With regards to the issue of free entry, we find that entry into this market is not free in the sense that enterprises that operate in this market segment have long years of operation as background and they require solid business contacts with their counterparts. We also find that operations in a small rice wholesaler market requires sufficient amount of local knowledge and familiarity with the surrounding environment, which a non-local wholesaler enterprise most often may not be able to meet. With regards to price bargaining, we also find that larger size enterprises have advantage since their price quotations are often regarded as *indicative market prices*, and smaller enterprises do not have much choice but to follow prices quoted by the larger ones. Even though market prices are determined by interactions of large numbers of buyers and sellers, it is typically the prices quoted by the larger enterprises that dictate the direction of price movements. Here we remind ourselves of price-leadership models in the oligopoly market structures. There are indications that the rice wholesaler market segment operates to a largeextent like a *price-leadership oligopoly* or a *dominant firm oligopoly* model.

4.2.1 Sample Enterprises

We have covered a total of 116 wholesaler enterprises in our survey over a total of twelve rice wholesale markets across seven districts. More specifically we covered five districts (Bogra, Dinajpur, Jessore, Kushtia and Naogaon) and two metropolitan city areas (Dhaka and

Chittagong). A total of 52 key informant interviews were also taken to assess the *state of competitiveness* of these twelve markets (here by the term "market", we mean small rice wholesaler centers) (see Table 2).

>>>TABLE 2 here

4.2.3 Enterprise Owner Profiles

A large majority of the sample enterprises (69 percent) are owned by single owners. Of the remaining 36 jointly owned enterprises, on an average a total of 2.72 owners own an enterprise. Out of 179 owners recorded in the wholesaler module, only one is female. Women are rarely found to be involved, even in the form of partnership. Average age of the owners is 44. Age of owners varies widely, from a low 24 years to a high 70 years. In terms of years of education, the average number of years of education of the owners has been found to be 10 years (SSC level).

4.2.4 Connectedness of the Wholesaler Markets

In terms of operations of the rice market, the survey locations are intricately connected to each other. We consider the case of *Dupchanchiya*upazilla location in Bogra district, for example. The major supplier locations for this market are Bogra (own and other Upazillas), Dinajpur, Gaibandha, Joypurhat, Naogaon, Netrokona, Porsha, Rangpur, Shapahar and Sirajganj. On the other hand, the major destination locations are Comilla, Chittagong, Dhaka, Feni, Gazipur, Savar, Munshiganj and Narayanganj. Thereby even a small rice center like *Dupchanchiya* operates as a collection point in the northern region and it sends rice to all the major rice demand locations in the country. Another point to notice is that connections between rice centers are sometimes two-way, not always unidirectional. For example rice is transported from Sylhet to Chittagong and at the same time rice is also transported from Chittagong to Sylhet.

4.2.5 Size of the Wholesaler Markets

The survey locations clearly differ in terms of number of enterprises operating there (Table 2). The rice wholesale markets studied in Dinajpursadar (Dinajpur) and Kushtiasadar (Kushtia) are very large; around 250 enterprises or more in each of these locations. Compared to these, markets located at *Dupchanchiya* (Bogra), *Jhikargacha* (Jessore) and *Sharsha* (Jessore) are very small, with number of enterprises less than 20.

We propose to categorize markets with more than 200 enterprises as "large" markets, with in between 40 to 200 enterprises as "medium" sized markets and with less than 40 enterprises as "small" sized markets. According to this categorization it turns out that we have covered four "large" markets, three "medium" markets as well as five "small" markets. On the other hand we have used indicators for the size of enterprises, such as "large", "medium" and the "small" (this is based on each respondent's self-reported assessment of the size of his respective enterprise as compared to the other enterprises within the same market). Within the surveyed rice markets, on an average, around 20 percent of enterprises classified themselves as "large", 35 percent as "medium" and the remaining 45 percent as "small" enterprises.

4. 2.6Entry and Exit of Enterprises in the Wholesaler Markets

A number of rice wholesaler markets are relatively old, with enterprises' establishments dating back to the 1950s. Entry is continuing in all the locations even now. Some markets such as Chittagong City Corporation areas have been quite active, with as many as 40 firms entering and another 35 firms exiting during the last 5 years. On the other hand, some locations such as *Dupchanchiya* have actually seen a reduction in market size with five firms exiting during the last 5 years (Table 3).

With regards to the question of whether entry into rice wholesale markets is difficult or not, most key informants from different markets have mentioned moderate level of

difficulty involved in the process. The difficulty on behalf of a potential entrant is that entry into this market requires a large amount of financial capital and sufficient knowledge as well as experience in this particular trade. In some large markets, particularly in the major locations such as Chittagong and Dhaka, it is difficult to get suitable space for establishing the shop as some of these market locations are already crowded. An additional requirement for entry into this market is that the potential entrant enterprise needs to have contacts with a large number of potential clients or business partners.

With regards to the question of whether there were cases of exit from the markets; most of the key informants of the respective rice trading centers cited cases of exit during the last 5 years. Frequency of exits differs in the different surveyed locations. For example, Kushtia is a large sized market that did not register any cases of exit, while Dupchanchiya is a small sized market that registered five cases of exits along with zero cases of entry. This implies that markets themselves are evolving continuously at varying magnitudes of entry and exit.

Rice wholesalers often operate as commission agents who act as an intermediary between rice millers and end-point wholesalers and/or retail wholesalers. As commission agents, the rice wholesaler often undertakes transactions on behalf of the millers on to the final-point wholesalers. Sometimes, on the basis of intermediary role played by the commission agent-cum-wholesaler, the miller sends the agreed upon rice stock to the final-point wholesaler, and obtains the money from the commission agent within some specified period of time. Hence, the commission agent expects to receive payments from the final-point wholesaler. However, contracts between these two parties are often verbal or small note-based, not legally documented. Sometimes, the final-point wholesaler delay payments to the commission agent, and in extreme situations, they completely failed to make the agreed upon

payments. Thus, most of the cases of exit in the surveyed markets were due to this kind of default in transactions, as reported by the key informants.

4.2.7 Market Shares of Enterprises in the Wholesaler Market

Through the KII module, the key informants of different rice wholesale centers were asked to list the names of enterprises that had had the largest market shares in their respective local markets at different points in time during the last five years. Key informants of the same markets mentioned the same enterprises in most of the cases. Interestingly, the (perceived) market shares of the enterprises at different points in time as mentioned by the key informants closely match with each other. This implies that in any market, there is a common perception of market leaders in terms of market shares and changes in the shares over time. We find that the names of top market share-holding enterprises do not change much and the market shares of these enterprises do not exhibit wide fluctuations either. These enterprises have been reported to have a broader client base and a larger long-term reputation in the market, and at the same time have huge financial resources that absorb most kinds of shocks, particularly in cases of default in transactions.

4.2. 8 Pricing and Bargaining in the Wholesaler Markets

Wholesaler enterprises covered in the survey mostly function as “commission agents” in the market, and in some cases they operate as “wholesalers”. As commission agents, their role is to bridge millers to rice wholesalers and/or retailers at the end point. The basic steps involved within this bridge that lead to the price being set are described as follows.

The miller sends specifications of the rice and a reservation level of price is quoted to the wholesaler (commission agent). The price quotation is set on the basis of different costs such as paddy procuring costs, cost of transforming paddy into rice, storage and other additional costs, and agency fee of the commission agent. This agency fee in the rice markets is set by the market associationbased on a consensus among all the member enterprises.

Hence, the fee is fixed for all the wholesalers within a particular market. Agency fees usually vary in different rice markets. Interestingly, the commission agent charges a fee on both suppliers (the millers) and buyers (wholesalers at the end point of the market).

As the commission agent is informed of the miller's quoted price (which already includes his fee from the miller), he adds his fee (to be taken from his buyers) and then bargains with the retail wholesalers, keeping in mind the existing market prices. The commission agent tries to obtain a price which will be at least equal to the miller's quoted price and his fee. Meanwhile, representatives of the buyers would want to purchase rice at the lowest possible price given the quotations from the commission agent. Once the bargaining is done, the commission agent writes a hand-written invoice and informs the miller of the transaction. Accordingly, the miller arranges the transport and sends the quoted amount of goods to the destination.

An important point to note, the commission agent always gets his agency fees from both parties that he connects. In any case, if the price bargained minus and agency fee (charged on retail wholesalers) is higher or lower than the miller's quoted price, the miller receives the lower/extra revenue. Since the bargained price always depends on existing market prices, the commission agent eventually shifts the price burden on to the miller.

Once the goods have been supplied, the retail wholesaler is required to transfer money to the commission agent, and simultaneously, the commission agent is required to transfer money to the miller. Therefore, the miller holds the commission agent accountable, staying out of the transaction relation with the retail wholesalers. Here lies the risky part of the commission agent's job. It normally takes quite a long time for the commission agent to acquire all outstanding sales. In a worst case scenario, the buyer can also default his payments.

Lastly, the retail wholesaler procures rice from the miller, stores it and sells it over time. Therefore, he requires storage space. The retail wholesaler bears all the price risk of the rice procured. The survey found some enterprises operating as both commission agents as retail wholesalers.

4.2. 9 Establishment of the Wholesaler Enterprises

The sample wholesale enterprises have documented long years of stay in the rice business since the average number of years of stay in business is 15.72 years. There is not much of a difference in terms of locations regarding this issue except for the northern location of Naogaon, where the average years of stay are around 24 years. Most of the sample enterprises have been newly started, whereas some more prominent rice markets such as Kushtia and Naogaon, the tendency to inherit the business is slightly higher (Table 4). In terms of sources of financing, owners' own savings from non-agricultural activities have been most commonly cited as major source of funds, and this is evident throughout the country. Remittances, sale of assets, borrowing from family and friends, loans from private commercial banks have been cited as other sources of funds in some cases. The median value of costs of establishment in the whole sample is reported as TK. 0.45 million (nominal values reported for the year of establishment, not converted into current values). Cost of entry into this rice wholesale market can thus be considered reasonably high.

Table 4 here

4.2.10 Business Contacts of the Wholesaler Enterprises

We find that the rice wholesale market is intricately interconnected and this has been helped by widespread use of mobile phones. Rice wholesalers have business contacts with other businesses, and the addresses often cover the entire area of the country. This is more prominent in the case of the northern wholesale markets. For example, an enterprise in Naogaon has on an average business contacts with 22.5 numbers of millers, 19.17 numbers of

other wholesalers and 14.25 numbers of paddy *aratdars*. These large number of business contacts indicate that there may be intense competitions in terms of price offers and bargaining among wholesalers in different locations as well as within the same location. Another interesting feature is that all the contracts are informal, and there is nowhere any legal, written document in the entire rice market. Therefore "trust" and "reputation" play important role in day-to-day business transactions, whereas default risk is always present in this environment. Transactions are done both in cash and credit, yet credit transactions are more common.

4.2. 11 Financing of the Wholesaler Enterprises

In terms of sources of fund for working capital, all enterprises in Bogra area mentioned public commercial banks, and one enterprise mentioned taking loans from informal money lenders. Credit transactions with miller and other wholesalers are also reported to be widespread in the rice markets of Bogra. Chittagong rice market enterprises mentioned re-investments as the main source of fund for working capital. Dhaka rice market enterprises were evenly split in their responses as nearly half of them mentioned re-investment from own business, most of the remaining ones mentioned private commercial banks, and a few enterprises mentioned public commercial banks.

4.2. 12 Rice Varieties offered by the Wholesaler Enterprises

The sample wholesaler enterprises have provided a list of rice or paddy varieties that they have sold during the last one year. The list presents an amazing array of rice varieties that are on offer, for example, on an average some 7 rice varieties have been mentioned by each sample wholesaler. Taking into consideration common names across enterprises, we find that a total of 177 numbers of varieties of rice have been listed by the sample 116 wholesalers. Out of the total of 177 varieties, 69 varieties have been listed as *Aman* varieties, 97 as *Boro* varieties, 3 as *Aus* varieties and the remaining 8 as common for two crop seasons. We find

that *Boro* season offers more diversified varieties in the rice market as compared to the *Aman* season.

Rice varieties in the *Aman* season includes names such as BR 30, *Chinigura*, *Govindabhog*, *Guti*, *Heera*, *Kataribhog*, *Sharna*, *Najirshail*, *Paijam*, *Ranjit*, etc. On the other hand, rice varieties in the *Boro* season includes names such as BR 11, BR 28, BR 32, *Jirashail*, *Miniket*, *Pari*, *Chandina*, *Baashfuli*, Hybrid *Heera*, *Parija*, etc. The varieties that have been listed as *Aus* season varieties are *BorshaliPaijira*, *Sharna* Thin, Chinese, etc. This amazing list of varieties imply that it is quite difficult for an economic agent in the rice market to be well informed about all the fine details and be able to bargain with the other agents on that basis. In a market like this where quality and product characteristics vary this much, bargaining of price within some ranges is expected since every agent may not have the same opinion about a particular variety and therefore their willingness-to-pay will differ. At the same time, it is also possible that agents may not have the same knowledge about the varieties in question. In an informal setting like Bangladeshi rice markets, we can expect widespread bargain among agents on the valuation of rice varieties and our survey findings match this assessment.

4.2. 13 Price Movements of Rice Varieties of the Wholesaler Enterprises

The sample enterprises have been asked to recall the price movements of rice varieties that they sold in their respective enterprises throughout the previous one year. We find some interesting features of the data. Firstly, prices of the same variety do not differ much across the entire country.. Secondly, prices differ not only across markets but also within the same market. Even a small market like Dupchanchiya has exhibited price differences across enterprises for the same variety of rice, and in some cases this difference is more marked compared to differences of average prices across the country.

We now examine price movements of the wholesaler enterprises with respect to the size of enterprises, such as “large”, “medium” and “small” (this classification is based on the sample

enterprises' assessment of their respective size compared to the other rice enterprises within the same market). We find that within the same market there is some tendency for prices to move together across size of enterprise. One pattern that is found is that prices of "large" and "medium" enterprises in general slightly exceeds the prices settled by "small" enterprises, for the same variety of rice and within the same rice wholesale market. In other words the "small" enterprises generally closely follow prices quoted by the "large" and "medium" enterprises, but they often settle for a slightly lower price compared to the "large" and "medium" ones. This can be interpreted as follows: the "small" enterprises take into consideration price being quoted by the larger enterprises, and yet settle for a reduced price. This is plausible since "small" enterprises do not have the same amount of reputation and do not possess the same amount of bargaining power as compared to the larger ones. Therefore there is higher risk involved on behalf of the counterpart business enterprise when business is being conducted with a "small" enterprise rather than a "large" or "medium" enterprise, the riskiness being in terms of authenticity of quality of rice being supplied (by the "small" one). Another disadvantage that "small" enterprises have is that they may only be able to supply a smaller amount in total whereas larger enterprises can supply a much larger amount. A third factor that may work against the "small" enterprises is that they may have lesser number of contacts or references and thereby may have to take a discount in terms of price quotations. Summing this up, "small" enterprises may have lower bargaining power in the market and this result in their accepting discounts for sale.

4.2. 14 Profitability of the Wholesaler Enterprises

In the wholesaler enterprise module, we have collected enterprises' own reports of their respective monthly average profits. We estimate an OLS regression (with heteroscedasticity-robust standard errors) of natural log of the monthly average profits as reported by the enterprises on enterprise size and area specifications as well as number of enterprises in the

rice wholesale market. We find that the estimated regression coefficient of area dummy for Kushtia enterprises is statistically positively significant (p-value=0.00). This implies that, controlling for size and number of enterprises, only Kushtia enterprises tend to have statistically significant higher amount of monthly profits compared to the Dhaka enterprises. We note that we have a mix of millers and wholesalers and also enterprises in dual roles of being millers and wholesalers as well as commission agents in the Kushtia area. A statistically significant result only for Kushtia location may have the implication that within the rice wholesale market structure, enterprises that operate as a mix of millers and wholesalers/commission agents have a tendency to exhibit higher growth rate of profits. We find that both the estimated coefficients for size of enterprise dummies such as "large" and "medium" are statistically positively significant as compared to the base of "small" enterprises, controlling for other variables in the model. A statistically significant result is also found in the joint significant tests for "large" and "medium" enterprises. This implies that controlling for other variables in our regression model, the growth of (self-reported) average monthly profits have a tendency to be higher for large and medium enterprises as compared to those of small enterprises. We can infer from this result that large and medium enterprises are more efficient and have a tendency to exhibit faster amount of profit growth as compared to the small ones. This indicates that there are some economies of scale in the rice wholesale sub-section of the rice market (more prominent in the cases where millers and wholesalers overlap in their operations).

3.3. 17 Pricing Decisions in the Wholesaler Enterprises

The wholesaler or commission agent is in between the miller on the one hand and the end-point wholesaler on the other hand. The commission agent bargains with the agents of the end-point wholesaler regarding pricing of some particular variety of rice, this bargain is set by miller's minimum quotation on the one hand and the maximum that the counterpart agent

wants to offer for the requested supply. The commission agent's fee is fixed, thereby a good bargain brings in higher revenue for the miller, and a bad bargaining results in lower amount of revenue for the same. A commission agent's reputation depends on how successfully he can make good bargains on behalf of the miller. Since this is not at all a one-time play, a business relationship between a miller and a commission agent is expected to last for long many years, commission agent's making a bad bargain may result in loss of this relationship, and this obviously a commission agent would want to avoid. A miller may have business relationships with many number of agents located in many different places, therefore he may switch from one commission agent to another within the same market, or switch to some other agent in a different market, or may decide to wait and see rather than agreeing with any agent at the current moment. Since the rice wholesale market has become heavily interconnected, a miller has by now a large number of options as commission agents and rice market centers. Therefore a miller in a North Bengal market such as Naogaon can compare prices offered by Dhaka market wholesalers with that of Chittagong market or of Sylhet market. Any small differences in offers may result in rice supply being directed to Sylhet rather than Chittagong, or Barisal rather than Khulna. This is the situation when the miller can exercise quite a bit of control over the price bargains because of his large number of business contacts. On the other hand, the situation for the miller can be unfavorable if he faces tough counterparts in the markets, such that some Dhaka retail wholesaler decides to bring supply from millers located in Naogaon market rather than those located in Kushtia market.

4.2.14 Market Structure of the Wholesaler Market

Why Some Firms may become dominant?

As we investigate the rice wholesale markets in detail, we find that the small market centers are often dominated by a number of 'large' firms. In order to understand more about a market

which is a mix of large firms and small firms, we refer to one particular type of oligopoly model described in Carlton and Perloff (2000), which suggeststhree main reasons for the creation of dominant firm -competitive- fringe market structure. First, dominant firms may have lower costs than fringe firms and that the firm may be more efficient than others. Second, a dominant firm may have a superior product in a market where each firm produces a differentiated product. Finally, a group of firms may collectively act as the*dominant firm*.The model shows thatdominant firm cannot set a high price when entry is unlimited, compared to when entry is restricted and assuming that fringe firms are all identical in costs, the market price cannot go higher than a fringe firm's minimum average cost. In this model, a dominant firm provides a *price umbrella* for smaller firms and as long as competing firms set price at or below the level of the dominant firm, they will be able to find buyers. Thus the price set by the dominant firm becomes an indicative price in the market. Carlton and Perloff(2000) show that even with unlimited entry of fringe firms, the dominant firm can gain and hold large share of the market for a long period with associated due to cost or other advantages such superior products, more business contracts, business goodwill etc.

In the dominant firm model with competitive fringe model (see Carton and Perloff, 2000), two different equilibrium exists depending on the dominant firm's marginal cost structure. The amount to be produced by fringe firms depends on the dominant firm's cost structure. In the first case, with dominant firms having higher marginal costs cannot set a price above minimum average cost of a fringe firm implying that The fringe firm could make zero economic profits and the dominant firm makes positive economic profits. A second equilibrium suggest that price is so low, with dominant firms having lower marginal costs, that no fringe firm stays in the industry and the dominant firm acts a monopoly.

In our case, price and output determination in the rice wholesale market closely matches withthe above model of a dominantfirm with a competitive-fringe with free entry and exits,

whereby dominant firm producesoutput alongside the competitive fringe firms (neither is able todrive the other out of the industry). The dominant firm providesan indicative price in the industry which we can associate with thephenomenon of *price umbrella*. The dominant firm (or a group oflarger-size firms acting as a dominant firm) still holds on to a largeshare of the market, and this share does not change much over time.On the other hand, there are a number of cases of entry and exit inthe market, more particularly among those firms which are on thefringe. Here also the cost advantage of the dominant firm (or firms) may arisefrom superior products (may be real or simply perceived), largerbusiness networks, greater reputation and trust. Therefore, we can conclude that the rice wholesale market functions as a dominant firm oligopoly constrained by the presence of a competitive-fringe with free entry into and exit from the industry.

4.3 The Retailer Market

4.3.1 Examining the State of Competitiveness in the Market for Retailers

In order to investigate the *state of competitiveness* in the rice retailer markets, we outline some basic features or testable implications that are expected to be present in this market. First we point out that a competitive market is one which contains a large number of buyers and sellers. The retailer market covers a large number of buyers and sellers; thus we do not find problems with this condition. Second we can expect free entry and exit of firms into this market. We find that even though it is not prohibitively expensive to enter into retailer market, usually this requires long “training” in the form of long(periods of)experiences of operations within this market. As was the case of enterprises in the rice wholesaler market, enterprises in the rice retailer markets also requires business connections which takes long enough time to build. Thus we find that entry into this market to some extent is restricted in the form of entry barriers such as requirements for experiences and business connections.

4.3.2 Findings from the Selected Retailer Markets

The primary survey covered a total of 21 retailers in the two end-point retailer locations, Dhaka and Chittagong. Out of these, ten retailers were interviewed in the Chittagong City Corporation area and eleven were interviewed in Dhaka City Corporation area (four from Babubazaar aka Badamtoli, three from Kochukhet and the remaining four from MohammadpurKrishi Market).

Retailers are small in operations, most often there are only two full-time employees besides the owner-manager. Most of the surveyed retailers only have some office space, measuring around 9 feet in length and 7 feet in width. Very few retailers have storage spaces. We can infer that retailers mostly concentrate on delivering the output at the ongoing market prices, rather than keeping it for some time. None of the retailer enterprises have any vehicle. And none of them have any branch offices. Most of the retailers have been established by the owners themselves, and some others have been inherited. On an average, the surveyed retailers are in operation for the last ten years, while the oldest among them has been in operation for thirty years.

Retailers have lesser number of business contacts as compared to the wholesalers. On an average, the surveyed retailer has business contacts with 7 local wholesalers, 5 local retailers and 50 local customers. Almost all of these contacts are within the same locality, this implies retailers simply obtain the produce from the wholesalers and deliver those within the locality among the customers. They do not have long-distance networks as it is often the case with the wholesalers.

4.3.3 Pricing and Bargaining as Reported by the Retailer Enterprises

The retailer enterprises report that they simply pass the wholesale prices on to the customers with some pre-fixed amounts of profit margins. The common practice is that they obtain their supply from the wholesale market at the ongoing (wholesale) market price, and then add

Taka 25 or 30 per 50-kg bag of rice and sell it to the customers. How much to add to the wholesale market price is a common understanding reached among the retailers themselves prior to transactions. The retailers meet two categories of business counterparts in price bargaining. First category is the rice wholesalers who would supply rice to them at the ongoing rice market wholesale price. Second category is the rice customers who would check with other enterprises and see if price could be any lower anywhere for the same variety, quality, specification, etc. The prominent presence of the rice customers at the end of the rice market supply chain makes sure that the retailer enterprises need to be watchful not to ask for "too high" a price that would scare away the customers, and again not to ask for "too low" a price which would reduce their own profit margin (the other group, the wholesalers, would want to have as high a wholesale price as possible). Since the retailers do not have any storage space, most often their role would be to just offload the rice produce on to the customers. In between two markets prices, one that of retail market, and the other of wholesale market-- the retailers have their profit margins (and costs of value addition for the retailers). Because of the presence of the customer group on the one hand and the wholesaler group on the other, the retailers do not have much influence on the directions of the market prices.

SECTION 5: SUMMARY AND CONCLUSIONS

We take a broader perspective on the issue of price divergence between international and domestic rice market in Bangladesh. In particular, we explore the nature of competition at different stages of the domestic rice market of Bangladesh by explaining incentives and behaviors of different agents in the market, particularly those of large firms operating in the middle of the rice market supply chain.

As observed rice markets contain a large network of intermediaries from the beginning point of the farmer to the end point of the consumer. These intermediaries differ in terms of their

respective sizes, roles, objectives, skill and expertise, technical support, constraints, strategies, etc. The intermediaries interact and often bargain with each other, who are striving for securing self-interests. Almost all the contracts within this market are informal, in the form of verbal or mobile phone conversation or hand-written notes. Here, "trust" and "reputation" are important on which firms investin course of time to operate in this market in the long run. On the other hand, default risk is seen quite high, which is often cited as one major cause of exit of firms from the market. Even though the entry cost is not prohibitively high, the issue of default risk, trust and reputation, skill and expertise and correct knowledge of the business partners are very essential to survive and hence all ofthese seem to act as steep entry barriers.

The rice market has become heavily interconnected except for the case of the farmers, who may have limited number of contacts and limited options other than selling produce at the price offered by a miller. It has been observed that large and medium-sized enterprises enjoy greater economies of scale in their operations compared to smaller ones.Within the rice market value chain, there are two points where major bargaining takes place; one is between the farmer and the *beparior faria* (often as agents of the miller) over the price and quantity of paddy, and the other is between the rice market wholesaler or commission agent (as agent of the miller) and the end-point wholesale or retail wholesaler over the price, quantity and quality combination of rice. The presence of rice miller in above bargaining processes potentially postpone sale, who by taking advantage of storage capacity is able to postpone sale at least for some period. This implies that millers or miller-cum-wholesalers have potentials to enjoy large leverage over the entire rice market value chain and thus potentially engage in opportunistic behavior within the market. Price determination process within the rice market value chain depends on relative bargaining power of the concerned parties. Large and medium enterprises enjoy the advantage of setting prices in the market, and the rest small

ones follow them. We therefore find prices of a variety of rice offered by all the enterprises to move together, whereas small enterprises sell the same at a slightly lower price. Additionally, within the rice wholesale market, the enterprises are free to sell any amount at any price they can obtain, whereas each of them is concerned about prices of neighboring enterprises.

With regards to the market structure, we observe that the rice wholesaler market is characterized by *a model of the dominant firm oligopoly with competitive-fringe firms with free, instantaneous entry and exit*. The larger wholesaler firms provide a *price umbrella*for the smaller firms whom we can consider as competitive, fringe firms. The status of dominance by one firm (or a group of firms acting as a single firm by way of an implicit cartel) may have arisen because of longer established reputation and trust in the market and real or perceived superior quality products and more numerous business contacts.

It is obvious that agents in the market interacting with each other pursue different objectives as well as face different constraints in their operations. Hence it is appropriate to examine different segments of the rice market separately to reach any conclusion regarding market competitiveness. The first segment of the rice market, one that involves primary growers, can be considered as to a large extent *competitive*, although the benefits of competition do not reach small and marginal farmers. The reason is that the small and marginal farmers often suffer from credit and cash constraints, and lack sufficient storage capacities, making them vulnerable to the opportunistic behavior of rather powerful intermediaries. As we proceed to the second segment of the market, which is of the rice millers and the wholesalers, we find that the issue of competition is rather interesting. Given that an entrepreneur has to have large financial resources as well as business connections to be able to survive in the rice wholesaler market, entry into this market (segment) is rather difficult. Also default risks of financial transactions or delays in payments often serve as an entry deterrent for new potential entrants.

Usually price bargaining depends on relative economic power and/or business connections of two agents whereby the more informed and connected agent can gain from the bargaining process. With regards to price movements of wholesale firms, within the price quotations of large farms are often considered as the indicative price and small and medium sized firms often follow the price. This resembles the standard oligopolistic price-leadership phenomenon, where one dominant firm sets the price and the other firms (often smaller ones) act as followers. This shows that competition in the second segment of the market i.e. wholesale market is to a large extent restricted. Even though a large number of wholesaler firms operate in the market, the ones with more economic resources and business connections dominate. In the case of the third segment (of the retailer firms), this mostly acts as a channel for prices set in the second segment (of the rice wholesalers).These findings have implications for policy since the differential behavior of different segment of the markets affect the consumers especially through creating burdens of the opportunistic behaviours of different agents.We cannot however conclude on how the *competition* (or lack of it) affects the end consumers since our study concentrated mostly on the price bargaining and negotiations within the primary growers' segments, wholesalers' segment and retailers' segments, we specifically did not follow the issue of burden of any opportunistic behaviors on the consumers directly. This could be an extension of the present study.

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TABLE1

Sample Distribution of the Primary Survey

District	KII	Enterprise Questionnaire		Farmer Questionnaire	Community Questionnaire	Prices List
		Millers, wholesalers and *aratdars*	Retailers			
Bogra and Naogaon	7	16	-	6	2	3
Chittagong	10	20	10	-	-	5
Dhaka	9	24	11	-	-	4
Dinajpur	6	16	-	8	2	5
Jessore	10	20	-	-	-	5
Kushtia	10	20	-	-	-	5
TOTAL	52	116	21	14	4	27

TABLE 2

Census Information of the Surveyed Rice Markets

District	**Market**	**Types of Trade** Wholesale/*arat* = 1 Import = 2 Retail = 3 Milling = 4	**No. of Rice Trading Enterprises and Market Size**	**No. of Enterprises by Size**		
				Large	***Medium***	***Small***
Bogra	C.O. Office Road Bazaar	1	15 (Small)	5	4	6
Chittagong	Chaktai Bazaar	1, 3	275 (Large)	60	115	100
	Shah Amanat Bazaar (Bera Bazaar)	3	18 (Small)	5	7	6
	Bohoddarhat Bazaar	3	12 (Small)	3	4	5
Dhaka	Ray Shaheb Bazaar	3	10 (Small)	2	2	6
	Babubazaar (Badamtoli)	1, 3	280 (Large)	90	140	50
	KochukhetRajanigandha Market	1, 3	72 (Medium)	15	25	32
	MohammadpurKrishi Market	1, 3	180 (Medium)	40	90	50
Dinajpur	Pulhat Bazaar	1	70 (Medium)	20	30	20
Jessore	Benapole Bazaar	1, 3	4 (Small)	2	2	
	Jhikargacha Bazaar	1	9 (Small)	2	3	4
	Navaron Bazaar (Sharsha)	1, 3, 4	6 (Small)	2	2	2
	Nowapara Bazaar (Abhaynagar)	1, 4	24 (Small)	6	8	10
Kushtia	Khajanagar	1, 4	310 (Large)	10	30	270

TABLE 3

Oldest and newest wholesaler enterprises' entry and exit

District/City	Upazilla	Oldest Enterprise	Newest Enterprise	Entry: last 5 yrs	Exit: last 5 yrs
Bogra	Dupchanchiya	1980	n.a.	0	5
Chittagong	Chittagong City Corporation	1970	2009	40	35
Dhaka	Babubazaar*aka*Badamtoli	1950	2011	35	32
	Kochukhet	1978	2009	4	2
	MohammadpurKrishi Market	1984	2010	25	20
Dinajpur	Bochaganj*aka*Shetabganj	1950	2008	4	3
	DinajpurSadar	1965	2009	35	0
Jessore	Abhaynagar	1960	2010	4	2
	Jhikargacha	1961	2010	1	0
	Sharsha	1980	2010	1	1
Kushtia	KushtiaSadar	1978	2010	30	0
Naogaon	NaogaonSadar	1962	2008	7	4

TABLE4

Years of Stay in Business of the Sample Wholesaler Enterprises

District	Number of Enterprise	How Established?		Average Years of Stay in Business
		Newly Started	Inherited	
Bogra	9	5	4	15.22
Chittagong	20	16	4	13.2
Dhaka	24	19	5	15
Dinajpur	16	12	4	19.63
Jessore	20	18	2	15.85
Kushtia	20	12	8	12.7
Naogaon	7	3	4	23.86
Total	**116**	**85**	**31**	**15.72**